

(57) Abstract

The invention relates to a medical X-ray device 5 arrangement for producing three-dimensional information of an object 4 in a medical X-ray imaging medical X-ray device arrangement comprising an X-ray source 2 for X-

5 radiating the object from different directions and a detector 6 for detecting the X-radiation to form projection data of the object 4. The medical X-ray device 5 arrangement comprises:

- means 15 for modelling the object 4 mathematically independently of X-ray imaging
- 10 - and means 15 for utilizing said projection data and said mathematical modelling of the object in Bayesian inversion based on Bayes' formula

$$p(x | m) = \frac{p_{pr}(x) p(m | x)}{p(m)}$$

to produce three-dimensional information of the object, the prior distribution $p_{pr}(x)$ representing mathematical modelling of the object, the object image

15 vector x , which comprise values of the X-ray attenuation coefficient inside the object, m representing projection data, the likelihood distribution $p(m|x)$ representing the X-radiation attenuation model between the object image vector x and projection data m , $p(m)$ being a normalization constant and the

20 posteriori distribution $p(x|m)$ representing the three-dimensional information of the object 4.

(Fig. 7)